AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Page 1

Please **amend** paragraph [0002] to read as follows:

[0002] As a radiation medical treatment apparatus for cancer and others using electron beam and X-ray generated therefrom in Prior Art Example 1, a linear accelerator (LINAC) is mainly used at present in which electron is accelerated to the energy of several to higher than ten ~~MeV~~MeV, for example,~~ the in the~~ Japanese Laid-Open Publication (JP H10-64700A (1998), p.4, Fig.1). Also as a linear accelerator, a microtron electron accelerator is ~~known~~known, for example, in the Japanese Laid-Open Publication (JP H07-169600A (1995) pp.2 - 3, Figs.1 and 2).

Please **amend** paragraph [0003] to read as follows:

[0003] Fig. 20 illustrates an example of makeup of a medical treatment linear accelerator of Prior Art Example 1. The medical treatment linear accelerator 100 comprises an electron gun 101, an accelerating device 102, and a magnetic bending apparatus 103 provided outside ~~of an~~of the accelerating device 102. The electron input into the accelerating device 102 by the electron gun 101 is accelerated along the beam axis of the accelerating device 102. The accelerating device 102 is made up of a microwave cavity for acceleration, and connected to a microwave oscillator 104 and its control circuit 105. The microwave oscillator 104 generates the electromagnetic field in the accelerating cavity of the accelerating device 102. When an electron passes the accelerating cavity of the accelerating device 102, it is focused by electromagnetic

field of microwave, and is accelerated. The thus accelerated electron beam 106 is irradiated from an output window 107 to become an output electron beam 108, and used for radiation medical treatment.

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Please **amend** paragraph [0004], which bridges page 2, to read as follows:

[0004] The orbital of said output electron beam 108 is changed by the magnetic bending apparatus 103, and it is irradiated onto such target 109 as gold or tungsten that generates X-ray, so the X-ray beam 110 can be generated. Said X-ray beam 110 is also used for radiation medical treatment. The size of said accelerating device 102 is necessarily about 2m for accelerating electron beam to 10 MeV, for ~~example~~example, refer to the Japanese Laid-Open Publication (JP 2001-21699A, p.2).

Page 2

Please **amend** paragraph [0005] to read as follows:

[0005] As another radiation medical treatment apparatus for cancer and others in Prior Art Example 2, there is a heavy particle beam accelerator. The heavy particle beam accelerator has high energy, so that it can irradiate the limited cancer organism compared with the linear accelerator by electron beam and X-ray of Prior Art Example 1, thereby has an advantage of smaller damage to normal ~~organism~~organism, for example, refer to the Japanese Laid-Open Publication (JP 2002-110400A, p.1 - 2).

Please **amend** paragraph [0006] to read as follows:

[0006] As an accelerator of Prior Art Example 3, there is a fixed field alternating gradient accelerator (FFGA accelerator) proposed by Ohkawa of Japan in ~~1953~~1953, for example, refer to ~~reference~~Reference (C. Ohkawa, Annual Report of Physical society of Japan, ~~1953, 1~~1953). An FFGA accelerator is characterized to use a so-called alternating gradient electric magnet having zero chromatic aberration on the gradient of such particles as electron beam, and to need no change of magnetic field along with acceleration, like conventional ~~syncrotron~~synchrotron accelerators, thereby to be able to use fixed magnetic field. Therefore, particles can be accelerated faster.

Pages 2/3

Please **amend** paragraph [0007], which bridges page 3, to read as follows:

[0007] However, an FFGA accelerator has difficulty in realization of accurate magnetic field distribution on the technological level of the time of proposal for realization of an alternating gradient electric magnet, and in recent years at last the design and test making of an FFGA apparatus for proton acceleration for the study of subatomic and atomic nuclear ~~physics~~physics, for example, refer to ~~references~~References (Y. Mori et al, "FFAG (Fixed-field Alternating Gradient) Proton Syncrotron",1999,The 12th Symposium on Accelerator Science and Technology, pp.81 - 83, and Yuzuru Nakano and KEKFFAG Group, "150 Mev Fixed Field Alternating Gradient (FFAG) Accelerator", Sep., 2002, Study of Atomic Nucleus, Vol.47, No.4, pp.91 - 101.). The noise reduction technology in the FFGA electron accelerator using a betatron

accelerating apparatus is disclosed in Japanese Laid-Open Publication (JP 2003-159342A, pp.1 - 2). Said noise reduction technology is to generate from a speaker the sound to cancel the noise from the FFGA electron accelerator, and not to kill the noise from the FFGA electron accelerator itself.

Page 6

Please **amend** paragraph [0019] to read as follows:

[0019] In the aspect mentioned above, said electron beam transporting part preferably consists of a septum electric ~~magnet of~~magnet or a converging lens to change the orbital of electron beam to outside of said vacuum container, and a first electric magnet for electron beam orbital adjustment is provided near the electron beam outputting part of the alternating gradient electric magnet in said vacuum container. Said first electric magnet for electron beam orbital adjustment is preferably set in the position $\pi/2$ radian delayed in the electron beam phase space with respect to said septum electric magnet or said converging lens. In accordance with the above-mentioned aspect, by providing the first electric magnet for electron beam orbital adjustment, the electron beam of higher intensity can be obtained.

Page 7

Please **amend** paragraph [0023] to read as follows:

[0023] In the aspect mentioned above, ~~the each~~each current of the divided coil part is preferably either controlled by the resistance connected in parallel with each coil part, or controlled by the current source connected to each coil part.

Page 10

Please **amend** paragraph [0029] to read as follows:

[0029] Next, the fixed-field alternating gradient electron accelerator 2 is explained. In Fig. 2, the fixed-field alternating gradient electron accelerator 2 comprises a vacuum container 10, an electron beam inputting part 11, an electric magnet 20 (20a – 20f), an accelerating apparatus 13, and an electron beam transporting part 26. The vacuum container 10 is a ring-shaped cavity container to be vacuumed. The electron beam inputting part 11 comprises an electron gun and others. The electric magnet 20 is that to generate fixed magnetic field designed to surround the vacuum container 10, and each electric magnet 20 is provided with ~~a divergent electric magnet~~divergent electric magnets 22 at both sides of a converging electric magnet 21. Here in Fig. 2, only the lower half of the electric magnet is shown, but an electric magnet of the same structure is set up above and facing it.

Pages 19/20

Please **amend** paragraph [0061], which bridges page 20, to read as follows:

[0061] Fig. 17 is a view illustrating a magneto-exciting method of the electric magnet shown in Fig. 16. As is shown in the figure, in the coil parts 64a - 64e of the divergent electric

magnet coil divided into 5, shant resistances 66a - 66e for current adjustment are connected in parallel, respectively. The values of shant resistances are such that the number of parallel is increased as r0 for shant resistance 66a, and two parallel connection of r0 resistance for shant resistance 66b. Both end parts 64g and 64h of a coil are constant current driven by a current source 68. The converging electric magnet 63 has the similar makeup. Therefore, since the currents I1 - I5 flowing the coil parts 64a - 64e respectively change, the magnetic flux densities generated ~~form~~from respective coil parts 64a - 64e change accordingly, and the magnetic flux density distribution of the divergent electric magnet 64 can be controlled. By similarly controlling the converging electric magnet 63, the magnetic flux density distribution of an electric magnet 62a made up of a divergent electric magnet and a converging electric magnet can be controlled to be optimum.